



# FACT SHEET

## UNITED STATES AIR FORCE

### **Titan II Space Launch Vehicle Profile**

The Titan II space launch vehicle is a modified Titan II Intercontinental Ballistic Missile that can lift approximately 4,200 pounds into low-Earth polar orbit. The rocket consists of two liquid-propellant stages, a payload adapter and payload fairing. The Air Force and Lockheed Martin have successfully launched 11 Titan II Space Launch Vehicles from Vandenberg Air Force Base, Calif.

Lockheed Martin built more than 140 Titan ICBMs, once the vanguard of America's nuclear deterrent force, for the Air Force. Ten manned and two unmanned Titan IIs were flown as space launch vehicles in NASA's Gemini program in the mid-1960s. Deactivation of the Titan II ICBM system began in July 1982. The last missile was taken from its silo at Little Rock Air Force Base, Ark., June 23, 1987. Deactivated missiles are in storage at Davis-Monthan Air Force Base in Tucson, Ariz.

Lockheed Martin Space Systems Company's Astronautics Operations has modified 14 Air Force Titan II ICBMs under contract to the Air Force Space & Missile Systems Center for use as space launch vehicles. This includes modifying the forward structure of the second stage to accommodate a 10-foot diameter payload fairing with variable lengths; manufacturing the new fairings plus payload adapters; refurbishing the Titans' liquid rocket engines; upgrading the inertial guidance systems; developing command, destruct and telemetry systems; performing payload integration; and modifying Space Launch Complex 4 West at Vandenberg Air Force Base, Calif., to conduct the launches.

The Titan II and Titan IVB Space Launch Vehicle programs are managed by the Titan systems program office at the Air Force Space and Missile Systems Center at Los Angeles Air Force Base. The Space and Missile Systems Center is a unit of the Air Force Space Command at Peterson Air Force Base, Colorado, and is the center of technical excellence for researching, developing and purchasing military space systems. SMC is also responsible for on-orbit check-out, testing, sustainment and maintenance of military satellite constellations and other Department of Defense space systems.



A Titan II launches a DMSP satellite from Vandenberg AFB. Photo courtesy Lockheed Martin.

## **Titan II Space Launch Vehicle Data**

<b>FIRST STAGE</b> Length: 70 feet Diameter: 10 feet Engine Thrust: 474,000 pounds (vacuum) ISP: 296 sec (vacuum)	<b>TITAN II SPACE LAUNCH VEHICLE FLIGHTS</b> Sept. 5, 1988 – Titan IIG-1 / SLC-4W / First Titan II SLV / Classified Payload Sept. 5, 1989 – Titan IIG-2 / Classified Payload April 25, 1992 – Titan IIG-3 / Classified Payload Oct. 5, 1993 – Titan IIG-5 / NOAA LandSat 6 Jan. 25, 1994 – Titan IIG-11 / Deep Space Program Science Experiment 1 for the Missile Defense Agency. Clementine was the first U.S. moon mission in more than two decades. April 4, 1997 – Titan IIG-6 / Defense Meteorological Satellite Program S-14 satellite May 13, 1998 – Titan IIG-12 / Advanced TIROS-NPOES Meteorological Satellite (NOAA-K) National Aeronautics and Space Administration National Oceanic and Atmospheric Administration. June 19, 1999 – Titan IIG-7 / QuikSCAT Scatterometer for NASA's Jet Propulsion Lab. (NASA/Ball Aerospace & Technologies Corp. Ocean Winds monitoring spacecraft). Dec. 12, 1999 – Titan IIG-8 / Defense Meteorological Satellite Program 15 Sept. 21, 2000 – Titan IIG-13 / Advanced TIROS-NPOES (NOAA-L) satellite. June 24, 2002 - Titan IIG-14/ Advanced TIROS-NPOES (NOAA-M) satellite.
<b>SECOND STAGE</b> Length: 40 feet Diameter: 10 feet Engine Thrust: 100,000 pounds (vacuum) ISP: 316 sec (vacuum)	
<b>LIQUID ROCKET ENGINES</b> Refurbished Titan II ICBM engines Propellant: Nitrogen Tetroxide & Aerozine 50 Subcontractor: Aerojet	
<b>PAYLOAD FAIRING</b> Diameter: 10 feet Lengths: 20 to 30 feet (25 feet for Coriolis) Aluminum skin-stringer tri-sector design Subcontractor: Boeing	
<b>GUIDANCE and NAVIGATION</b> Inertial Guidance System Consisting of Inertial Measurement Unit and Missile Guidance Computer Subcontractor: Ensco	